Model Question Paper-I/II with effect from 2021 (CBCS Scheme)

USN | | | | | | | | | | |

First Semester B.E Degree Examination
Elements of Mechanical Engineering 21EME15/25

TIME: 03 Hours **Max. Marks: 100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.
02. Use of Steam tables are permitted to solve numerical on steam.

		Module -1	**Marks**
Q. 1	a	Briefly explain the emerging trends of mechanical Engineering in Manufacturing and Energy Sector	10
	b	Define the following terms with respect to steam: 1. Saturation temperature 2. Latent heat of vaporisation 3. Quality of the steam 4. Sensible heat 5. Degree of superheat	10
		OR	
Q. 2	a	What is solar Energy? Apply the Solar energy conversion technic into electrical energy in a solar cell	10
	b	With a neat sketch explain the working principle of a Pelton Turbine	10
		Module-2	
Q. 3	a	What are polymers? What are its characteristics?	6
	b	State the application of Composites related to Aircraft and Automobile industry	4
	c	What is gas welding? Explain with neat sketch principle of operation of oxy-acetylene gas welding.	10
		OR	
Q. 4	a	Give the differences between thermoplastics and thermosetting plastics.	10
	b	With a neat sketch explain the principle and working of TIG welding. List its applications	10
		Module-3	
Q. 5	a	With the help of a P-V diagram explain the working of a four-stroke diesel engine.	10
	b	With help a line diagram describe the working principle of Electric vehicle	10
		OR	
Q. 6	a	With Suitable example enumerate the application of refrigeration in Food Processing Industry	10
	b	Write a short note on Centralised Air Conditioning and enumerate how it is differed from the comfort room air conditioner	10
		Module-4	
Q. 7	a	Give the classifications of Gear Drives. Enlist each of their applications	6
	b	A belt drive is used to transmit 20kw power from an electric motor to an exhaust fan. The diameter of motor and fan pulley are 250mm and 1000mm respectively. The speed of motor shaft is 750 rpm and thickness of belt is 6mm. Determine i) Speed of the exhaust fan pulley ii) Velocity of the belt iii) Torque required to transmit the power	6
	c	Classify the robots on the basis of physical configurations	8
		OR	
Q. 8	a	With Suitable example explain the working principal Rack & pinion and Gear & Bevel gear.	8
	b	Explain the Industrial application of robots specific to material handling and Assembly	8
	c	Differentiate between Mechanics and Machines	4

Module-5			
Q. 9	a	Explain with neat diagrams, any two metal cutting operations performed on a lathe machine.	8
	b	With the help of a block diagram, explain the basic elements of CNC machines	8
	c	Differentiate between open loop and close loop System	4
OR			
Q.10	a	Explain the principle of working of horizontal milling machine	6
	b	Illustrate the working of an automated washing machine to demonstrate the mechatronic system	8
	c	Enlist the advantages of CNC machine in mechanical Industry	6

Table showing the Bloom's Taxonomy Level, Course Outcome and Program Outcome				
Question		**Bloom's Taxonomy Level attached**	**Course Outcome**	**Program Outcome**
Q1	**a**	**L2**	**CO1**	**PO1, PO12**
	b	**L1**	**CO1**	**PO1**
Q2	**a**	**L3**	**CO2**	**PO1**
	b	**L2**	**CO2**	**PO1**
Q3	**a**	**L1**	**CO1**	**PO1**
	b	**L2**	**CO2**	**PO1**
	c	**L2**	**CO1, CO2**	**PO1**
Q4	**a**	**L3**	**CO2**	**PO1**
	b	**L2**	**CO2**	**PO1**
Q5	**a**	**L2**	**CO2**	**PO1**
	b	**L2**	**CO1**	**PO5**
Q6	**a**	**L2**	**CO2**	**PO1, PO12**
	b	**L3**	**CO1, CO2**	**PO1, PO12**
Q7	**a**	**L2**	**CO1**	**PO1**
	b	**L3**	**CO2**	**PO2**
	c	**L2**	**CO1**	**PO1**
Q8	**a**	**L3**	**CO3**	**PO1**
	b	**L2**	**CO2**	**PO1, PO12**
	c	**L3**	**CO2**	**PO5, PO12**
Q9	**a**	**L2**	**CO2**	**PO1**
	b	**L2**	**CO1**	**PO5**
	c	**L3**	**CO2**	**PO1**
Q10	**a**	**L2**	**CO1**	**PO1**
	b	**L3**	**CO3**	**PO5**
	c	**L2**	**CO2**	**PO5**

Bloom's Taxonomy Levels	**Lower order thinking skills**		
	Remembering (knowledge): L_1	Understanding (Comprehension): L_2	Applying (Application): L_3
	Higher order thinking skills		
	Analyzing (Analysis): L_4	Evaluating (Evaluation): L_5	Creating (Synthesis): L_6